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March 12, 1991

Ms. Maureen O'Mara 5HS-12
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, IL 60604

Re: Waukegan Tar Pit Site (WTPS)
Waukegan, Illinois

Dear Ms. O'Mara:

This letter is partial fulfillment of the AOC (currently pending signature by EPA) and summarizes the initial investigation findings and describes the proposed tasks for additional investigation at the Waukegan Tar Pit Site. The proposed additional investigation follows from the initial field investigation conducted by Barr Engineering on February 27-28, 1991. The results of the February field investigation indicate that free tar is present under a layer of fill and debris in areas extending beyond the surficial tar pit. Shallow soil boring made during the February field investigation found tar north, south, and east of the tar pit. The shallow borings could not be placed to a sufficient depth to assess the thickness of the tar because of the equipment that was available on-site.

The objectives of additional investigation at the site are to (1) collect data on the thickness of the tar underneath the fill at several locations, (2) further evaluate the lateral extent of tar at the site, and (3) collect data on the subsurface soils and depth to clay adjacent to the tar pond at the site. It is proposed that these objectives be met by performing additional soil borings using a track-mounted soil-boring drilling rig at the site to a depth sufficient to delineate the vertical extent of tar.

The results of the proposed additional investigation will be incorporated with the data collected from the February investigation in order to calculate an estimate of the volume, depth, extent, and composition of the tar. The results of the additional investigation will be described in a future report.

Summary of February Investigation

The objective of the February investigation was to delineate the vertical extent of the tar pit on the site using hand probes and collect tar samples for assessing chemical and physical characteristics. The limit of the surficial tar pit is shown on Figure 1. Most of the surficial tar pit was covered with 6 inches of water (see Figure 1). The poor ice conditions on the pit, combined with the stiff nature of the tar in some locations, necessitated reducing the number of hand probes in the tar pit. However, a sufficient number of probes were made in the tar pit to provide a reasonable basis for assessing the depth of viscous tar and physical characteristics of the tar in the pit.

The east and north portions of the tar pit appear to contain a hard, somewhat brittle tar which could not be penetrated with the hand probes. In the south and west portions of the tar pit, the tar was softer and could be penetrated in places to depths approaching 3 feet. From the behavior of the probe, it seems likely that a layer of hard tar may underlie the soft tar.

Tar samples were collected from three locations in the tar pit (see Figure 1), which correspond approximately to the three locations identified in the Work Plan. These three samples were composited into three quart-size samples, consisting of approximately 30 percent of each of the three tar samples. One of the quart-size samples was given to the U.S. EPA on-site representative and the other two quart-size samples will be analyzed.

The on-site representative for the U.S. EPA, Ms. Jennifer Wendell of Ecology and Environment, requested that borings be conducted some distance

from the edge of the surficial tar pit. Because of the gravelly nature of the soils and the existing frost conditions at the site, these borings had to be performed using the powered ice auger. The ice auger is not designed for soil borings but was made to work in a partially satisfactory manner. The ice auger was able, in most case, to penetrate to a depth of about 3 feet. A hand auger was then used to collect a sample from the bottom of the boring for visual evaluation.

The results of the ice auger borings and the hand probes of the tar pit are summarized in Table 1. Borings B-1 through B-6 are located south of the tar pit in an area characterized by gypsum-board debris and rail-bed "clinker". Free, soft tar was encountered at a depth of approximately 2 feet in Borings B-1 through B-5. The thickness of the subsurface tar could not be determined because the ice auger could not penetrate the tar. In boring B-5, however, the hand auger was easily pushed an additional foot into the tar, suggesting that the subsurface tar is at least 1 foot thick in the vicinity of boring B-5. Boring B-6 did not encounter tar. The soil in B-6 did not appear to contain gypsum-board debris but did contain cobbles of clinker. It is possible that boring B-6 was not sufficiently deep to encounter tar because the ground elevation of B-6 is somewhat higher than the ground elevation at the other borings.

Attempts were made to auger in the area immediately adjacent to the west edge of the tar pit. Because of the very gravelly nature of these soils, the ice auger could not penetrate more than a few inches. Boring B-7 is northwest of the tar pit and was augered to a depth of approximately 3 feet. No tar was encountered in B-7 but the water in the borehole had an oily sheen.

Several other borings were performed north and east of the tar pit. Boring B-10, which is directly north of the tar pit, just inside of the fence, did not encounter tar and the sandy characteristics of the soil suggest that the soil may not be fill. South of boring B-10, closer to the tar pit, tar was found in the subsurface mixed with sand and gravel. East of

the tar pit, but inside the fence, free tar was encountered in the subsurface. Again, the thickness of the tar could not be determined with the equipment available.

A cross section through some of the probe and boring locations is in Figure 2. The cross section suggests that the top of the tar is nearly at the same elevation everywhere across the site. The minimum thickness of the tar at some locations can only be inferred because none of the borings penetrated through the tar.

In summary, the tar extends in the subsurface north and south of the surficial tar pit. The thickness of the subsurface tar and the characteristics of the underlying soils could not be assessed in the February investigation because the available equipment restricted the depth of the boreholes.

Proposed Additional Investigation

The February investigation qualitatively delineated the lateral extent of tar at the site and provide an estimate of the soft tar thickness for the tar pit. However, the data collected in this investigation is not sufficient to make reliable estimates of tar volume and tar thickness. An additional investigation will be conducted that will delineate the vertical extent of the tar, verify the lateral extent of tar, and provide data on the depth to the clay "hard pan" which is believed to underlie the site.

The proposed additional investigation would consist of approximately 12 to 20 soil borings, performed using hollow-stem drilling techniques and continuous soil sampling. Rotary drilling techniques would be used when auger refusal occurs. The actual number of soil borings will depend upon the actual extent of the subsurface tar. The proposed tasks for the investigation include:

Task 1: Soil Boring Technical Specifications

Technical specifications for conducting the proposed soil borings will be developed. The purpose of the technical specifications is to ensure that the drilling firm contracted to perform the soil borings has the necessary equipment, contingency equipment, materials, and experience to perform the soil borings in an acceptable and cost-effective manner.

Task 2: Soil Borings

The locations of the proposed soil borings are shown in Figure 3. It should be recognized that, depending on what is encountered in the borings, the actual number and location of borings may vary somewhat. The soil borings will be performed using a hollow-stem auger. Soil sampling will be accomplished either by a continuous sampler or by a split-spoon sampler. Split spoons will be taken continuously with depth. Borings will be augered to a depth of 2 feet below the bottom of the tar or until "hard-pan" clay is encountered, whichever is less. At least two soil borings will be augered to the top of the hard-pan clay to determine the depth of the top of the clay. All soil borings will be logged by an on-site geologist.

Approximately 3 soil borings will be made along the east side of the tar pit on the site using a hand-held, gas-powered auger specifically designed for boring in soil. A hand-held boring auger must be used in this vicinity because the location of the overhead power lines prohibits using a drilling rig. Split-spoon samples cannot be collected from these borings but the cuttings will be visually described and logged by an on-site geologist. A good approximation of tar depth and thickness can be made using this method.

Task 3: Analysis of Tar Samples

Tar samples will be collected from the soil borings and composited. The composited sample will be retained for possible analysis by disposal companies.

Task 4: Field Technical Memorandum

A technical memorandum, summarizing the field investigation procedures and results will be written. The memorandum is intended only to provide a salient overview of the investigation's field findings. The overall investigation report will provide greater detail, synthesis, and analysis of the data. The WTPS PRP group intend to conduct this additional investigation within two to three weeks.

If you have any questions concerning this additional investigation, contact the PRP group or me

Sincerely



Lawrence D. Dalen

LDD/rww

c: Sean Mulroney 5CS-TUB3
Melissa Wynne
Russell Selman
Gerald Karr
Patrick Doyle
A: RWW/WAUK2.WKP

TABLE 1
Waukegan Tar Pit Site
Summary of Borings and Probes

1. Borings

Soil borings were augured using a gas-powered ice auger with a 3.5 foot long, 6-inch diameter auger. The top 3 inches of soil was typically frozen and had to be broken with a pick ax prior to auguring. A 2-inch diameter hand auger was used to retrieve samples from the bottom of the augured borehole.

Boring B-1

Date of Boring:	2/27/91
Total Depth:	2.8 feet
Depth to Water:	2.2 feet
Tar Present?	yes - soft tar
Depth to Top of Tar:	2 feet

Boring B-2

Date of Boring:	2/27/91
Total Depth:	2.8 feet
Depth to Water:	2.5 feet
Tar Present?	yes - soft tar
Depth to Top of Tar:	2.5 to 2.8 feet (exact top uncertain)

Boring B-3

Date of Boring:	2/27/91
Total Depth:	2.5 feet
Depth to Water:	2.0 feet
Tar Present?	yes - soft tar
Depth to Top of Tar:	2.5 feet

Boring B-4

Date of Boring:	2/27/91
Total Depth:	2.0 feet
Depth to Water:	1.5 feet
Tar Present?	yes - soft tar
Depth to Top of Tar:	2.0

Boring B-5

Date of Boring:	2/27/91
Total Depth:	2.4 feet
Depth to Water:	0.4 feet
Tar Present?	yes - soft tar
Depth to Top of Tar:	2.3 feet (tar is at least 1 inch thick)

Boring B-6

Date of Boring: 2/27/91
Total Depth: 1.9 feet
Depth to Water: no water encountered
Tar Present? no
Depth to Top of Tar: N/A
Comment: black clinker and cinders encountered at 1.7 ft

Boring B-7

Date of Boring: 2/27/91
Total Depth: 3.1 feet
Depth to Water: 3.0 feet
Tar Present? no
Depth to Top of Tar: N/A
Comment: oily sheen on surface of water; HNU response in borehole was not above background levels; soil is cinders mixed with sand

Boring B-8

Date of Boring: 2/27/91
Total Depth: 2.7 feet
Depth to Water: no water in hole
Tar Present? yes - mixed with sand
Depth to Top of Tar: approx. 1 foot
Comment: HNU reading in borehole was 25 ppm

Boring B-9

Date of Boring: 2/27/91
Total Depth: 2.0 feet
Depth to Water: no water in borehole
Tar Present? yes - tar mixed with sand at bottom of hole
Depth to Top of Tar: @ 2 feet
Comment: HNU reading of 22 ppm at bottom of hole

Boring B-10

Date of Boring: 2/28/91
Total Depth: 3.0 feet
Depth to Water: 1.8 feet
Tar Present? no
Depth to Top of Tar: N/A
Comment: brown sand at all depths; no HNU response in borehole; good drillability; no odor

Boring B-11

Date of Boring: 2/28/91
Total Depth: 1.8 feet
Depth to Water: 1.6 feet
Tar Present? no
Depth to Top of Tar: N/A
Comment: No HNU response in borehole; 3 ppm HNU reading on cuttings; very gravelly sand; no visible tar; faint tarry odor

Boring B-12

Date of Boring: 2/28/91
Total Depth: 2.0 feet
Depth to Water: no water in borehole
Tar Present? yes - mixed with sand and gravel
Depth to Top of Tar: 1.8 feet

Boring B-13

Date of Boring: 2/28/91
Total Depth: 3.1 feet
Depth to Water: no water in borehole
Tar Present? no
Depth to Top of Tar: N/A
Comments: gravelly sand; HNU reading in borehole was 4 ppm

Boring B-14

Date of Boring: 2/28/91
Total Depth: 3.1 feet
Depth to Water: 1.3 feet
Tar Present? no
Depth to Top of Tar: N/A
Comment: sand is very dark; water has oily sheen; hand-auger core gives HNU reading of 3 ppm

Boring B-15

Date of Boring: 2/28/91
Total Depth: 1 foot
Depth to Water: 0.5 feet
Tar Present? no
Depth to Top of Tar: N/A
Comment: very gravelly soil with cobbles; HNU reading of hand-augured core was 1 ppm levels;

Boring B-16

Date of Boring: 2/28/91
Total Depth: 1.3 feet
Depth to Water: 1 foot
Tar Present? yes
Depth to Top of Tar: 1.2 feet
Comment: HNU reading in borehole was 100 ppm; HNU
reading of hand augured core was 85 ppm

2. Hand Probes of Tar Pit

Hand probes were used to attempt to estimate the depth of tar in the tar pond. A 3/4-inch diameter galvanized pipe was pushed into the tar until refusal. The depth of water above the tar at all probe locations was 0.5 feet. All penetration depths are measured from the top of the tar surface.

Probe P-1

Penetration Depth: 2.1 feet

Probe P-2

Penetration Depth: 0.3 feet (soft tar underlain by hard tar)

Probe P-3

Penetration Depth: 0.3 feet (soft tar underlain by hard tar)

Probe P-4

Penetration Depth: no penetration - hard tar

Probe P-5

Penetration Depth: 1.1 feet (soft tar underlain by hard tar)

Probe P-6

Penetration Depth: 1.8 feet (soft tar underlain by hard tar)

Probe P-7

Penetration Depth: 1.3 feet (soft tar)

Probe P-8

Penetration Depth: 0.2 feet (soft tar - underlying material is unknown)

Probe P-9

Penetration Depth: 2.7 feet of soft tar

Probe at Sample Site TS-3

Penetration Depth: 1.6 feet of soft tar

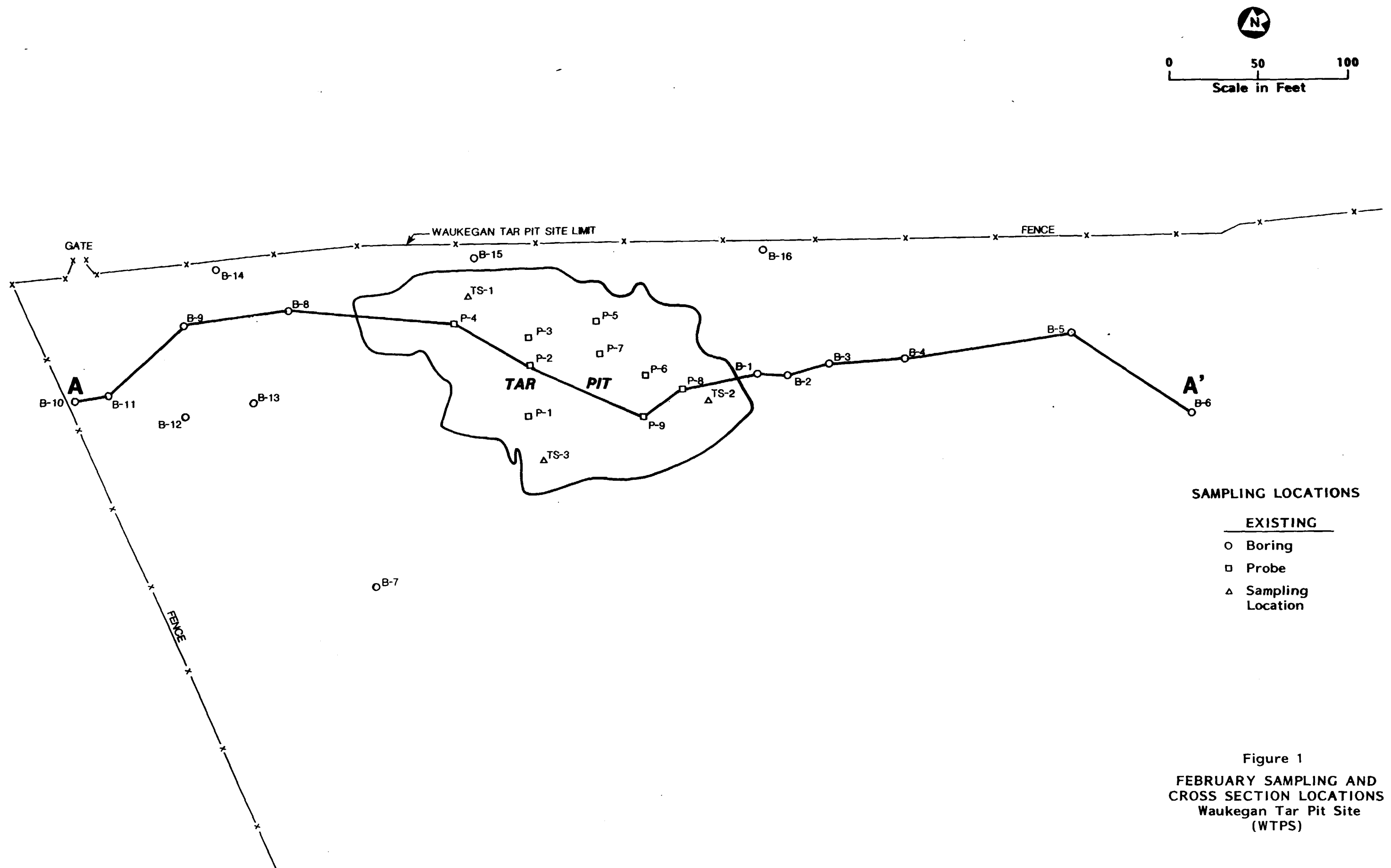


Figure 1
FEBRUARY SAMPLING AND
CROSS SECTION LOCATIONS
Waukegan Tar Pit Site
(WTPS)

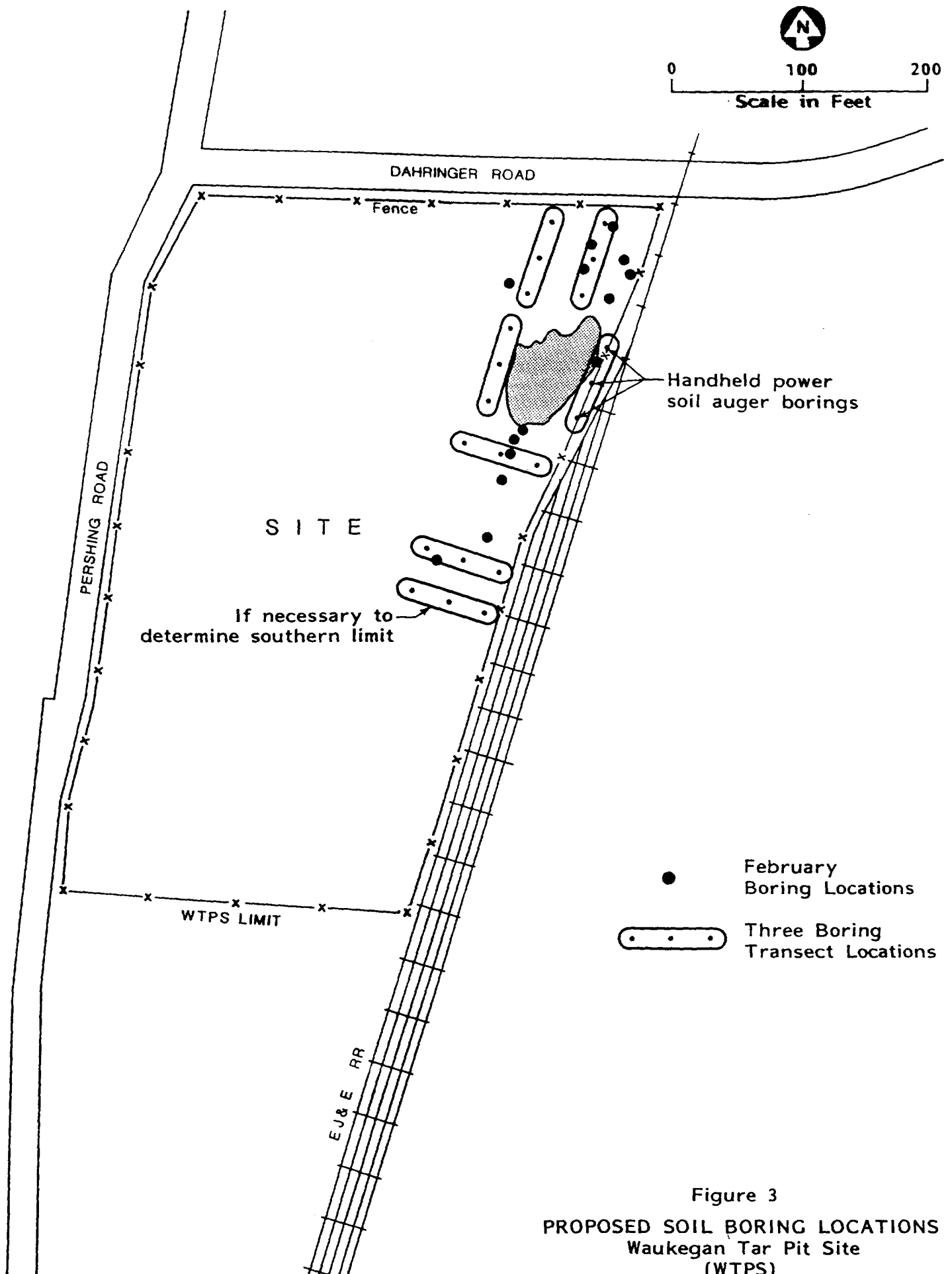


Figure 3
PROPOSED SOIL BORING LOCATIONS
Waukegan Tar Pit Site
(WTPS)